Current Status of $K^+ \to \pi^0 \mu^+ \nu_\mu \gamma$ study

FUJIWARA,Tsunehiro

Department of Physics,Kyoto University
fujiwara@scphys.kyoto-u.ac.jp

CONTENTS:

- ★ adds/corrections
- ★ background estimation
- ★ summary

Kinematic fit bug in NREG4

Incomplete treatment in NREG4 case ,sometimes, trigger “Signal 8 error” (floating point exception) in generating ntu-ples . “Signal 8 “ cause fatal-stop . The runs ,in which “signal 8” error occurs, are not used in later analysis. So this bug reduced effective KB_L (and more serious in full sample case) .

This bug is alredy fixed. Both of 1/3 and full sample are now free from this problem.

But ...

KB_LIVE miscounting

KB_LIVE counting method is bash-oneliner such as follows:

```
$ for i in $(gawk '{print $3;}' chain12.kumac ) ;
 do a=${i%%gamma3*} ; b=${i##nt*/};c=${a}../log/${b} ;
 d=${c%%.nt*}.klog ; grep KB_L $d ; done
 | grep -v KB_L_ECL  | ~/s.pl - 5
```

In full sample analysis ,ntuple-splitting often occurs . double/triple counting occur in some runs. It happened that KB_LIVE of full sample is about 30%larger than that of 1/3. This cause misunderstanding:

"1/3 sample is still bug-version ??"

Background summary(revised)

	1/3	full
sources	#events	#events
$K_{\pi 3}(BV/PV/OVP)$	1.39	3.97
$K_{\mu 3} + Acc$	1.33	7.33
$K_{e3}/K_{e3\gamma}$	0.15	0.20
$K_{\pi 2\gamma}$	< 0.23	<0.69
$K_{\mu 3}$+ splitted γ	< 0.55	<1.65
All Backgrounds	2.87 + <0.8	11.7 +<2.3
$K_{\mu 3\gamma}$	9.9	29.7

Summary & Prospects

Backgound estimation is consistent between 1/3 and full sample.
miscallaneous distribution checks are now ongoing.
If no problem ,branching ratio will be obtained soon.